

## **The optimal pattern modeling of knowledge management systems establishment in public sector organizations (Case Study: Tavanir Organization)**

**Rahman Ghaffari**

Ph. D Student of Policy Making: University of Tehran, Iran

Email: [rghaffari@ut.ac.ir](mailto:rghaffari@ut.ac.ir)

Tel: 09113543465

### **ABSTRACT**

*Knowledge is seen as the main asset for major organizations and a resource to achieve sustainable competitive advantage and in the developing business world, the importance of knowledge management in organizations is increased every day. The fact that many organizations neglect knowledge management is because of their vague understanding of the concept that exists in organizations. To overcome such a long-established challenge, it is necessary to set forth the basic definition of knowledge management, and an appropriate model should be presented which includes the circumstances and characteristics of organizations. Since there are many models which implement knowledge management in organizations, in this paper, we try to provide an appropriate and domestic model to exemplify the optimal pattern of knowledge management in public sector organizations, especially those which are related to Tavanir organization. To test this, our proposed model is measured through the distribution of a questionnaire with 89% Cronbach's alpha among senior managers and experts from Tavanir related organizations in Mozandaran province.*

**Key words:** Social Capital, Knowledge Management, Knowledge Management Models, Optimum Models

### **INTRODUCTION**

"Lester Taro", the famous economist, says: the basis for wealth foundation and economy today is the knowledge and expertise. Taro is speaking about a revolution which has its force roots in the brains and takes up its value from the minds. With the advent of the third industrial revolution, knowledge has changed into a uniquely competitive advantage. Today, many Fortune companies have special projects in the area of knowledge management (KM), and in particular they try to achieve their common goals and specific commercial objectives (Bergern, translated by Ghahramani, 1386). Now, as for an economic investment it is essential to have a proper and modern management, we need to have management for the optimal use and expedite preparation, use and expansion of knowledge. Knowledge management is a way which improves the development practices, sharing and using knowledge in an environment and build values out of the produced knowledge. The Aim of knowledge management is creating a

system by which the proper knowledge at a proper time and proper place is provided for individuals.

Today, knowledge management has increasingly turned into a vital stage for three reasons. First, in many organizations mental assets along with the physical and financial properties has gained importance. Second, while the post- World War II generations are leaving the organization, the fact is that a huge asset of knowledge that they possess will be lost if there is no attempt to keep them. Finally, the third point is that a good knowledge management system reduces unnecessary duplication of the work and increase organization efficiency (Robbins, 2009: 231).

Knowledge processes (knowledge activities) can be considered as a structured coordinator for the effective management of knowledge (Gold, 2001: 5). For example, Knowledge processes include activities such as creating, sharing, storing and using the knowledge. Since the knowledge processes indicate the main knowledge functions, competencies provide necessary infrastructure for the organization to enhance the effectiveness of knowledge processes (Sarvey, 1999: 13). Organizational performance is defined as the possible degree to which the corporate business achieves their goals of business. (Elenkov, 2002: 25). This can be determined through organizational learning, profitability or other obtained financial benefits by Knowledge Management. Employees and managers' enthusiasm and interest will be lost without assessing the success of knowledge management (Dell, 1999: 19). The type of leadership style and people management has undergone enormous changes over time and over different periods of life and evolution of human civilization. By the same token, we can mention the sources of power for managers in the evolution of societies and social Darwinism. The following table can completely illustrate the point.

**Table 1: Evolution of Societies and Darwinism**

Ages	Change and learning	Strategic source	management
Hunting age	Data emergence	Hunting ground	clubbing
Agriculture age	Data processing	The ground	whipping
Industrial age	Information emergence	Capital	asinine
Post-industrial age	Information processing	Information	informative
Age of wisdom	Knowledge emergence	human	humane

At the hunting age despite having tribal war survival efforts, the most important source of power were tribal populations and hunting areas. It should be noted that the clubbing style has been the most appropriate management of primitive human and hunting age culture. At Agricultural era, the land was the most important strategic source for the man, so the whipping style as to force people to work more and train them was considered best management style. In the industrial age, due to the emergence of a phenomenon called the Industrial Revolution, the owners' capital was considered the power source. But in the era that we live in which is called the post- industrial age or information age, the most important source of power for organizations and managers is knowledge management, and management style and Leadership also depends on their

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ability to usefully process the information. Today, if organizations are to remain sustainable in global competitions, they use knowledge as a crucial source in order to appear successful against their rivals (Park, 2010, 1).

Peter Drucker believes that although in past ages a literate was a person who could read and write, literacy at information age means someone who could effectively learn the provided information in an environment and teach to others. As it can be seen in the table the predictable age after the post-industrial age is the age of wisdom in which the most skilled one is its strategic power, and the management style based on spirituality and humanity is the top leadership of that era (Toffler, 1366). Alvin Toffler (1366) in his book "the Third Wave" states that in the world today economic growth factor is not the investment, manpower or raw materials, but rather new knowledge and ideas are causing economic prosperity and countries property is the offspring function science and opinions.

In an era where many scholars and scientists have thought of nuclear explosions and nuclear era, the era of knowledge explosion and information transaction has occurred. So, maybe that's why some believe that every five years and half the volume of knowledge will be doubled (the knowledge explosion era) (Iranzadeh, 1384).

Organizations in the new era should serve as a Time Machine to move from the past into the future in an uninterrupted manner (Iran born, 1384). Intangibles are the most important thing that must be managed to reach success (Sabuie et.al, 1997).

### **Knowledge Management**

The Chambers dictionary (2000) defines knowledge in this way "fixed opinion, something which is known, learned information, learning science, practical skills, knowledge, understanding and so on". Knowledge is a structured combination of data which is reached through processes, rules, practices and experience. In other words, knowledge is a concept which is emerged through thinking. Knowledge is only born in the minds of people. Krechner (1997) who compares the information and knowledge on "What is knowledge" provides valuable explanations. He believes that the information processed by the human brain becomes knowledge and gains values. Therefore, knowledge includes processing, creating or using the information in the people's brain. Corbin et.al (2007) also believes that the difference between information and knowledge is the perception degree and formulating the skills and experience in the two (information and knowledge) (Corbin et.al, 2007: 2). Markuez (2001) has suggested that knowledge itself is not considered the source of competition among organizations, but this is the appropriate and correct use of them which serves as one advantage (Sedra & Gable, 2010: 4). Some features of knowledge based on Mac Dermot (2001) and Ali (1997) is provided here:

- 1 - Knowledge is disordered and cluttered.
- 2 - Knowledge is self-organizing.

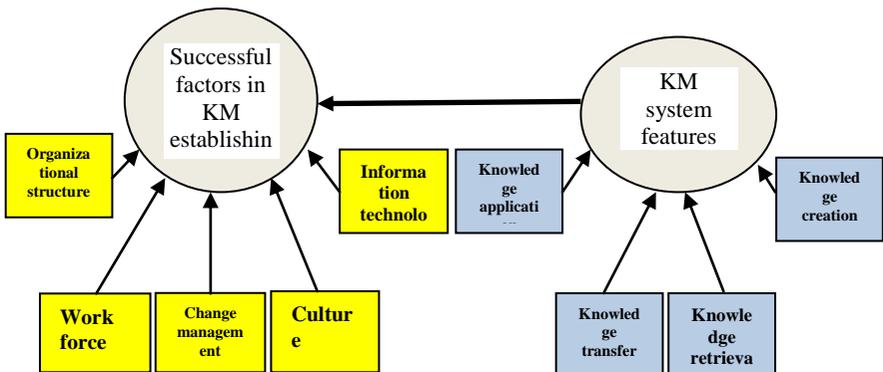
- 3 - the most important factor of knowledge transfer is the language.
- 4 - Knowledge is slippery like a fish.
- 5 - Knowledge is multidimensional.
- 6 - Knowledge is a social phenomenon.
- 7 - Providing and distributing knowledge help its growth.
- 8 – Knowledge is presented in different methods.

Knowledge management and related Strategic concepts, have been considered as the important components and elements for the survival of the organization and maintain its competitive position (Martensson, 2000; 1). Knowledge management is referred to a process of gaining experience and intelligence in an organization and using it for nurturing innovation through continuous learning. Knowledge management is in fact a key to gain a competitive nuclear advantage in an Organization (Wang, 2009: 8).

Knowledge management helps organizations to become more flexible and also helps them to serve as learning environments (Yahya & Goh, 2002: 24). Harvey and Denton provided reasons that show knowledge management is regarded as a competitive advantage in an organization (Harvey& Denton, 1999).

1. The nature of the production factors has shifted from capital, labor force, especially intellectual labor.
2. Rapid changes have occurred in the world of business.
3. Wide (overall) acceptance of the fact that knowledge has a competitive advantage.
4. Increasing managers and employees dissatisfaction of the traditional management concepts, commanding and controlling management.
5. The highly competitive nature of global business
6. Increased customer demand

**Figure 1: The Conceptual Model of the Research**



### **Knowledge Management Goals**

Weick (1993) believes that knowledge management can enable organizations to improve their usual performance to a creative performance along with consciousness. The purpose of knowledge management is to discover new perspectives on learning, knowledge creation and development of local and foreign competition through a deliberate approach in contemporary world (Ford, 1996: 41).

In early 2000, the knowledge management motto, creation, dissemination and use of knowledge and information of high quality to achieve individual and organizational learning were discussed. Knowledge management is more than a mere thinking about how to manage an organization; it is a strategic asset for the organization. Figure 1 shows a conceptual model of this research.

### **Knowledge Management Enablers**

A variety of enablers of knowledge management are shown in knowledge management literature. Among these cases, change management, organizational culture, structure, people and information technology (IT) are included in the research model. Studies have shown that strengthening the competence of knowledge management systems improves the overall knowledge management system (Sedra & Gable, 2010: 8).

**1 - Strategies and appropriate change management:** From the late 1990s, knowledge management is considered as the major force of organization change and value creation, as it is referred to as reforming economy leading to large body of changes in the world (Liew, 2008: 1). Hubert Saint states that knowledge management strategy provides a framework within which the Organization has a goal setting activities to leverage knowledge assets. Strategy also express the processes, tools and infrastructure needed for knowledge to be effectively distributed (Chatzkel and Liebowitz, 2000: 11). Knowledge management in any organization requires the existence of a manager or an informed leader that is influential in the organization. Organizational culture in which "innovation" is seen as a dominant value of knowledge management is a facilitating elements. Knowledge strategies are divided into two categories of to encryption and personalization (Tierney et al, 1999: 8). Encryption strategy focuses on the combination of knowledge in the organization to enable us to put the knowledge into a coherent field and make it available to organizations' employee. Such approach includes separating knowledge from its owners that is knowledge should be effectively extracted and encoded. Personalization strategy identifies the tacit dimensions of knowledge and assumes that knowledge essentially is spread through informal communication in which sharing knowledge will develop through interaction and dialogue from person to person (12: Desouza, 2002). Introduce knowledge management to organizations is a strategic issue; therefore,

it requires infrastructure preparation and pre-planned strategy in the organization (Iiew, 2008: 6).

**2 - Organizational Culture:** Culture is one of the most important factors for successful knowledge management. Culture is not only defined as being "knowledge is valuable and precious" but also defined as "knowledge should be kept within the organization as the competitive advantage and organizational innovation" (18: Long, 1997). Organizations must have an appropriate culture, so that it can encourage the people to create and share knowledge within the organization (Holsapple, 2001: 9). People do not refuse to share knowledge and are not indifferent to the organization and are not afraid to share their knowledge (Davenport et al, 1998). Researchers have shown that the type and style of organizational culture (especially Adhocracy culture in organizations) will be very effective in supporting the implementation of knowledge management processes (Jones, 2009: 146).

**3 - Organizational Structure:** The structure of an organization can be both facilitative and debilitating for knowledge management realization as Ichjio emphasizes that the company should be maintain stability in their organizational structure to protect and support their knowledge (Ichjio, 1998).

**4 - Human Resources (Human Capital):** Human capital is one of the most important type of knowledge or intellectual assets in the organization because these assets are the sources of creativity. This type of tacit knowledge assets exist within the staffs of an organization which is one of the most vital factors influencing the performance of each organization. Human resources are the top factor in organizational knowledge creation and have the most vital role in implementing knowledge management (Pouloudi, 2006: 14). Therefore, it is very important to manage those who are willing to create and share knowledge (O'Dell, 1999: 23). Knowledge and competence (jurisdiction) may be acquired through recruiting new people with new skills (Stonehouse, 1999: 14). Human capital represents the tacit learned knowledge in the minds and thoughts of employees. Human capital is an important source of innovation and recreation in an organization and it (human capital) is defined as of a as a combination of employees' competencies, thinking and creativity.

**5 – Technology:** Technology helps to manage knowledge (Gold, 2001: 11). Today, new technology in the changing global information technology environment is the IT (Vidogah, 2009: 2). IT means the degree to which knowledge management through the use of IT is supported. Many researchers have found that IT is the most determining factor in creating knowledge. IT affects the knowledge creation in different ways. Firstly, IT facilitates the collection, storage and exchange of information on a scale that was unattainable in the past and will endorse the process of knowledge creation. Secondly, the developed technology will integrate distinctive knowledge processes. This integration can eliminate the barriers of communication between different sections of an organization. Thirdly, IT supports all knowledge creation styles and is not only restricted to the explicit

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(visible) knowledge transfer. In order to achieve the desired results, organizations should not only have an appropriate IT infrastructure, but also must integrate computer and human systems, network technologies and other organizational arrangements so that they can effectively acquire, store and use knowledge (7: Meso, 2000).

### **Knowledge Management Processes**

A number of studies have focused on the knowledge management processes. They have separated knowledge management into several processes. For example, Alavi & Leinder have identified four processes such as: creation, storage, transfer and application of knowledge as knowledge management processes (Alavi & Leinder, 2001: 3). These processes (often but not always) are simultaneously placed in a linear sequence (Beckman, 1999: 16).

Among these processes activities related to knowledge creation (eg, knowledge creation and construction) (23: Demarest, 1997) are important because knowledge creation is a strategic weapon in the modern world; without creating a permanent knowledge, the business will be doomed to failure. Knowledge creation is a continuous process where individuals and groups within a company and between companies share their explicit and tacit knowledge (Nonaka & Takeuchi, 1995: 11). Knowledge creation is a dynamic process of interaction between tacit and explicit knowledge in different levels of organizations. Knowledge that has been created can be transferred from a person to another person, or it can be stored at individual, group, or organization level.

Nonaka and Takeuchi (1995) argue that tacit and explicit knowledge and complement each other and affect each other in the innovative activities of individuals. Explicit knowledge refers to the employees' expertise and knowledge that is visible and can be easily learned and transferred. But tacit knowledge refers to the intangible skills and competencies of employees who normally seek knowledge and experience. A model of knowledge creation process based on this critical assumption is developed that human knowledge is created through social interaction between tacit and explicit knowledge in which the interaction is referred to as conversion. It should be noted that such a conversion does not happen inside people, but rather it occurs between them and within an organization (Bijres, 1999: 9). The interaction between tacit and explicit knowledge (Nonaka & Takeuchi knowledge creation mode, 1995: 11)

**Table 2: Cross-tabulation of Income Group and Service Quality Gap**

To explicit knowledge	To tacit knowledge	
externalization	socialization	From tacit knowledge
combination	internalization	From explicit knowledge

### **Knowledge Management Models**

Different models have been suggested for knowledge management by many researchers and perhaps due to cultural differences and management, the model

is not still approved (Afrazeh, 1386), that's maybe the biggest reason for the importance of a domestic model which is culturally appropriate in any society. Different models of Knowledge Management would be briefly outlined here.

### **A) Hessig Model**

Hessig model (2000) is composed of the following four processes.

**Create:** that refers to ability to learn and communicate.

**Store:** through which an organized storage capability that enables quick search of information, access to information and effective sharing of knowledge is provided.

**Spread:** The process helps to develop a collective spirit in which individuals work as partners to pursue common goals.

**Use:** This process will develop the idea that creating new knowledge will be possible through objective knowledge application.

### **B) Mark Model (M. Mac Alrvy)**

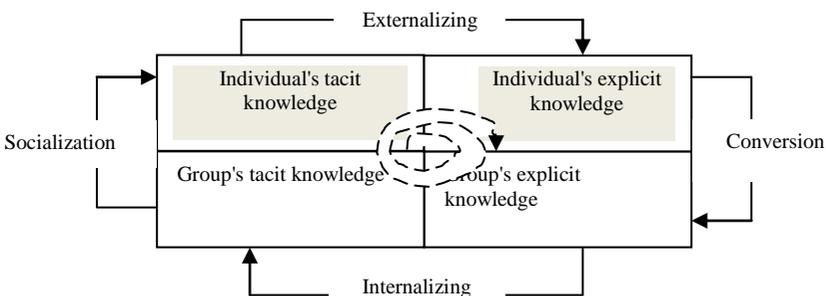
Mac Alrvy (2002) defined a new intellectual framework for knowledge management which is called "knowledge life cycle ". he divided His process of knowledge creation into two large processes namely knowledge production and knowledge continuation.

Knowledge production is process of creating new organizational knowledge which is done through group learning, gaining knowledge and information and knowledge assessment. This process is synonymous with organizational learning.

Knowledge continuation; this section is accomplished through some activities that prescribe the distribution and sharing knowledge which include special projects like knowledge distribution, search, teaching, sharing and other social activities.

### **C) Nonaka and Takeuchi model**

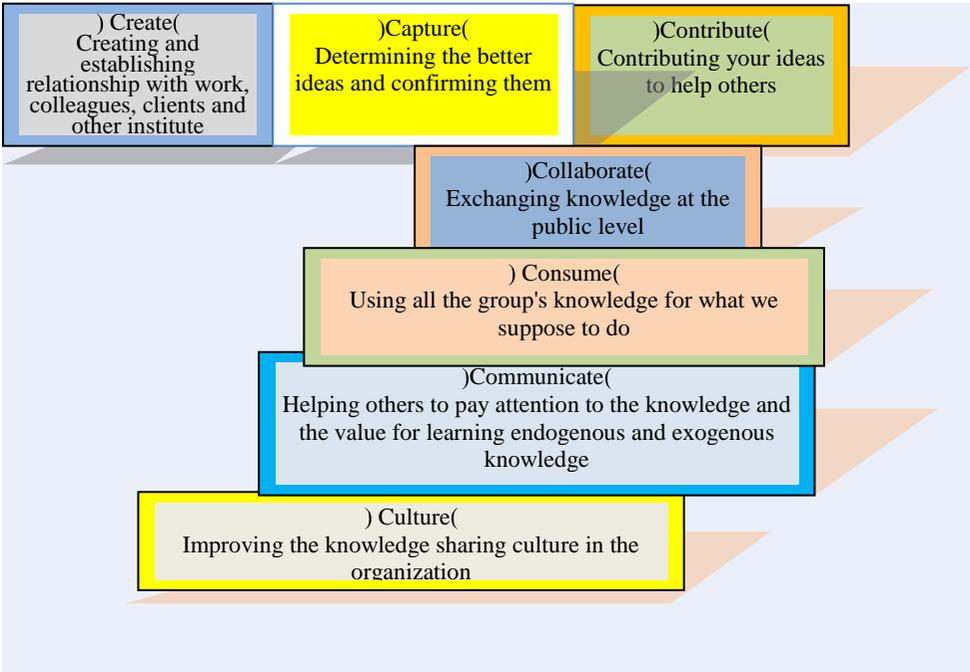
*Figure (3) Nanoka and Takeuchi spiral model on knowledge management*



#### **D) Seven "C" Model**

This model is based on seven words beginning with letter «C» which is given by the America Productivity and Quality Center. The component along with descriptions of each Model is given in figure "2".

*Figure 2: The Seven "C" model*



#### **Knowledge Management in Government Agencies**

The tacit and explicit knowledge concepts are classified by Nonaka to design organizational learning theory. In his model, unlike previous models, he focuses on two types of knowledge "implicit or tacit" and "explicit" and their conversion to one another and also how they are created on all organization levels. In this dynamic model, he expressed how to use and convert these knowledge and how knowledge management is assumed to move in spiral manner in both field according to figure "3".

Perhaps the last 15 years could be considered as the boom years of knowledge management in the public sector. According to Fortune magazine statistics in 2002, 90% of the world's top 500 companies have had formal programs for knowledge management. But over the years government agencies were lagging behind. According to the Organization Economic Cooperation and Development (OECD) report published in 2003, the organization should implement the principles and models of knowledge management based on the following reasons:

- 1 - Knowledge as being changed to the most important source of effective activities and measures of the organization.
- 2 - Government agencies authorship instead of ownership in the new era.
- 3 - Globalization.
- 4 - Private sector capabilities.
- 5 - Citizens' knowledge increase.
- 6 - The loss of experienced workforce in government organizations (OECD, 2003, P, 5-12).

But in recent years, various researches with the title of knowledge management have been conducted in government agencies (Abtahi and Salavati, 1385). Recent researchers' studies are represented in the following table.

**Table 3: Prominent Research Studies in the Area**

	<b>The researcher</b>	<b>The research title</b>
1	Mc Keen & Zech (2005)	The effect of knowledge management on organizational performance
2	Gold (2002)	Designing a model for knowledge management effectiveness
3	Moherman (2001)	Relationship between knowledge management and organizational effectiveness
4	Khalife Mohammad & Lio (2003)	Providing knowledge management success model
5	Regains & Oily (2002)	the effect of the Structure of informal interaction networks on knowledge transfer process in the organization
6	One Kro (2000)	Knowledge management and organizational culture
7	Mickapolos & Sycojis (1999)	Knowledge management and governmental agencies
8	Karle Weick (2000)	Application of knowledge management in governmental management
9	Kong & Pandeia (2003)	Review of knowledge management in government agencies

### **Methodology**

The current study aims at determining the empirical relationships in the field of interaction between knowledge management components and thus trying to develop an appropriate pattern for domestic implementation of knowledge management in government agencies. Consider applied objectives and data collection the research is descriptive and correlational. In order to determine the reliability of the test, the Cronbach alpha method was used. This method is used to calculate the internal coordination of the various features of measuring tools. For this purpose, an initial sample including 30 questionnaires as pre-test was prepared and then by using the obtained data from questionnaires and SPSS statistical software the correlation coefficient was calculated for the total items using Cronbach alpha which was 89 percent. The populations of this study were the managers and experts from Tavanir organization and related companies of Mozandaran province and because the data in the study are of quantitative type, the Pearson correlation was used to test the correlation.

### **RESULTS AND DATA ANALYSIS**

Implementation of knowledge management systems over several years can create specific norms of knowledge assets (including intangible assets or intellectual property) in the organization (Lee, 2004: 5). Our findings also show

that knowledge management capabilities are considered the key factor in the effectiveness of organizations. Effective implementation of knowledge management system also depends on the knowledge infrastructure capabilities (structure, culture and technology) and capabilities in accurately implementing the knowledge management processes in organizations (Anderson, 2009: 134).

**Conceptual model and research hypotheses:**

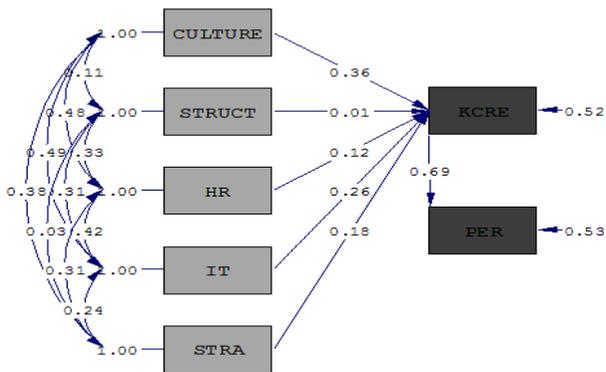
In this conceptual model, culture, structure, information technology, human resources and strategy are the independent (exogenous) variables and knowledge creation variable is endogenous mediator variable and endogenous variable functions is (final variable).

**Model hypotheses**

1. Culture has a direct, positive and significant effect on knowledge creation.
2. Structure has a direct, positive and significant effect on knowledge creation.
3. Human resources have a direct, positive and significant effect on knowledge creation.
4. Information technology has a direct, positive and significant effect on knowledge creation.
5. Strategy has a direct, positive and significant effect on knowledge creation.

The model in standard estimation point is as follows. Model relational indices indicated a poor match of the structural model (path analysis) that are due to the degree of freedom compared to chi square which equals to 4.58 and greater than the acceptable value of 3 and the RMSEA value is 0.08 but it can be improved by applying some changes in the software.

**Figure3: Showing the Evaluated Model**



Chi-Square=22.92, df=5, P-value=0.00035, RMSEA=0.207

strategy	IT	HR	structure	Culture	The correlation between
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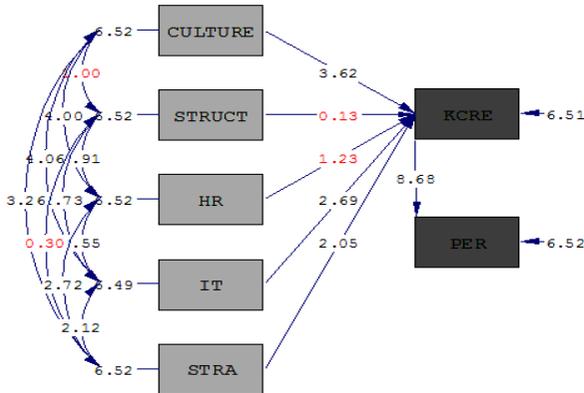
0.378 significant	0.493 significant	0.481 significant	0.109not significant	Culture structure Human resources IT strategy
0.032 not significant	0.320 significant	0.333 significant		
0.309 significant	0.419 significant			
0.240 significant				

**Table 4: Showing the correlation between exogenous variables of the model**

Significant value position: Regarding the obtained significant values, the hypothesis regarding the effect of culture, information technology, strategy and knowledge creation is confirmed because the significant value is greater than 1.96.

We will see in the chart below that the only factor that was not completely prepared in implementation of knowledge management in power distribution organization of Mozandaran province is the organizational structure.

**Fig 4: Showing the Final Model with Test Results**



Chi-Square=22.92, df=5, P-value=0.00035, RMSEA=0.207

Fortunately, the effect of changing management styles and strategic planning in Tavanir in providing intelligent knowledge management system has been highly influential.

As the final suggestion, the Tavanir organization should maintain its long term objectives and in order to achieve diversity and conservation law should provide appropriate structure for dealing with environmental changes and responding to changes.

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